

# Voice Disorders in Lawyers; an Analytical Cross-Sectional Study in Khyber Pakhtunkhwa

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## Author's Contribution

<sup>1-3</sup>Conception and design, Collection and assembly of data, Analysis and interpretation of the data. <sup>3-4</sup>Critical revision of the article for important intellectual content, <sup>1-2</sup> Statistical expertise

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## A B S T R A C T

**Background:** Professional voice user is a term used for people using their voice as a primary tool for trade and their job but if a problem arises in them like aphonia or dysphonia, they become discouraged and sought for alternative jobs. This article figures out such issues in lawyers's population which are the one; prone to vocal-misuse.

**Objective:** The study aim to investigate the occupational risk for voice disorders in lawyers and its association with increase in their age, on provincial level of Khyber Pakhtunkhwa.

**Methodology:** Analytical cross-sectional study was carried among the lawyers practicing in the high court and district courts of Khyber-Pakhtunkhwa. Data was collected using convenient sampling from the sample size of 373 and analyzed using SPSS. Probability of developing voice disorders was determined through VHI scoring while t-tests are used for further analysis of the data.

**Results:** On the basis of results, it was observed that lawyers with increase in their age by practicing in this profession was at greater risk for developing voice disorders (Age: 51-60, n=198). On the basis of VHI, prevalence for the lawyers who scored for severe level was 53% While most of the participants were seem to be handicapped for voice due to its emotional component (mean=16.02,  $\sigma^2=159.96$ ). Results also shows significant association for severity with increase in age ( $P<0.005$ ).

**Conclusion:** It can be concluded that lawyers become prone to develop voice disorders with the passage of time with their continuous professional practice.

**Keywords:** Lawyers, Voice disorders, VHI

## Introduction

In general population many people face voice problems but this number increases in different professions and occupations demanding high frequency sound due to noise in working background and poor system of audibility. One third of our labors work in places where voice is considered as a primary tool.<sup>1</sup> Professional voice user is a term used for people using their voice as a primary tool for trade and their job but if a problem arises in them like aphonia or dysphonia, they become discouraged and sought for alternative jobs.<sup>2</sup> There are certain professions in which slight voice problem can cost impairment of both function and occupation thus affect the quality of life.<sup>3</sup> To seek assistance or treatment, the voice user must first

acknowledge the problem. For this purpose, "Perceptual measuring has become the recognized 'gold standard' for voice assessment" when compared to other laryngological assessment approaches.<sup>4</sup>

Some authors categorize voice users based on how important voice quality is in their line of work.<sup>5, 6</sup> According to Koufman and Isaacson, Elite vocal performers are professional singers and actors while professional voice users include lecturers, instructors, barristers, clergy, and telephone operators; and non-vocal professionals are doctors, businessmen, and receptionists. Non-vocal professionals are

those who don't have a lot of voice work to do.<sup>5</sup> Other authors divide voice professionals into groups based on their vocal workload and demand for high-quality voices.<sup>1</sup> Verdolini and Ramig attempted to evaluate the prevalence of voice disorders in various workplace occupations. Teaching was the most prevalent occupation among visitors to voice clinics in several nations. Singers, counselors/social workers, lawyers, and clergy are all professions that are prone to seek otorhinolaryngological care for voice difficulties.<sup>7</sup> According to estimates, 5%–10% of the workforce in the United States are "strong occupational voice users".<sup>8</sup> Approximately, 3.3 million private and public elementary and secondary school teachers represent the largest group of professionals who use their voice as a primary tool of trade. This group also includes clergy, counsellors, telemarketers, singers, lawyers, tour guides, and stage actors.<sup>9</sup> Professional voice users account for 71.9% of the working and treatment-seeking population, whereas 8.8% of the general population report prior vocal issues and only 6.2% refer to current voice problems. Among them, teachers were the highly evaluated population for the vocal complications which cause the US societal costs of \$2.5 billion annually.<sup>7, 10</sup>

At present, the true prevalence of voice disorders among lawyers were undetermined that made it difficult to precisely identify the population at risk, to delineate the causes and effects of voice disorders, to develop early screening procedures to identify those at risk, to estimate societal costs associated with voice disorders, and to plan health-care services to prevent or treat such problems in the absence of such data. Therefore, this study was majorly designed to determine the prevalence of voice disorders among lawyers and to evaluate association of severity for voice problems with increase in age of this population.

## Methodology

Analytical cross-sectional survey was carried out in different courts of Khyber Pakhtunkhwa from February-July 2021 after taking ethical approval for conducting the study. Consent was taken individually from every lawyer in participation of the study who completed the inclusion criteria.

Sample size for the study was 373 calculated through Raosoft sample size calculator with confidence interval of 95%. Convenient sampling technique was used in data collection. Lawyers of more than 1 year of experience (both male and females) and age more than 20 years were included in the study while those with the history of any surgical or invasive procedure 6 months prior to participation and those with already handicapped voice and taking therapies were excluded. As the research was carried out during Covid19 Pandemic, so most of

the data collection was done through online google forms, from the judicial courts in Khyber-Pakhtunkhwa.

Voice Handicap Index (VHI); a standardized questionnaire was used in the study which has three subscales; functional, physical and emotional, to determine the severity of voice problems. The questionnaire had 30 questions corresponded 10 to each subscale and had four options for each question. The range of responses were between 0 to 4; indicating 0 for Never, 1 for Almost Never, 2 for Sometimes, 3 for Almost Always and 4 for Always, on the basis of which VHI scoring was made.

Prevalence was found and a paired t-test for two sample of means was used to find the variance in order to determine the individual effect of functional, physical and emotional component of VHI on the prevalence of voice disorders in lawyers. Data was further analyzed to check the significance of the study ( $P < 0.005$ ) to determine association between the numerical variables of the study (Age v/s Severity) for testing the null hypothesis by using paired t-test.

## Results

Age for most of the participants were 31-40 years with the frequency of 166. Those with the age 21-31 were 89. The participants of age 41-50 were 94 while those with the age 51-60 were 24. On the basis of gender, maximum participants of the study were male i.e. n=353 while 20 participants were female. The response of participants came from 23 different districts mentioned in the Table I.

Table I: General demographics		
Variables	Category	N
Age	21-30	89
	31-40	166
	41-50	94
	51-60	24
Gender	Male	353
	Female	20
Cities	Abbottabad	2
	Bannu	2
	Charsada	22
	Dera Ismail Khan	6
	Dir	4
	Haripur	2
	Karak	6
	Kohat	18
	Lakki marwat	2
	Malakand	2
	Mardan	126
	Nowshera	46
	Peshawar	105
	Shangla	2
	Swabi	20
	Swat	6

Table II: Prevalence of Voice Disorders based on VHI												
Prevalence on Basis of VHI (Actual Numbers)	AGE								Gender		Total	
	21-30		31-40		41-50		51-60		M	F	M + F	
VHI	M	F	M	F	M	F	M	F				
Mild (0-30)	29	8	76	6	16	2	4	0	125	16	141	
Moderate (31-60)	16	4	12	0	2	0	0	0	30	4	34	
Severe (61-120)	32	0	72	0	74	0	20	0	198	0	198	
<b>Total</b>	<b>77</b>	<b>12</b>	<b>160</b>	<b>6</b>	<b>92</b>	<b>2</b>	<b>24</b>	<b>0</b>	<b>353</b>	<b>20</b>	<b>373</b>	

Table III: Prevalence based on VHI subscales (t-Test: Paired Two Sample for Means)				
	Age	Functional	Physical	Emotional
Mean	36.97	16.78	16.43	16.02
Variance	65.85	127.17	147.06	159.96
Observations	373	373	373	373
Pearson Correlation	0.22			
Hypothesized Mean Difference	0			
df	372			
t Stat	31.57			
P(T<=t) one-tail	1.3781E-107			
t Critical one-tail	1.648960062			
P(T<=t) two-tail	2.7563E-107			
t Critical two-tail	1.966361504			

Table IV: Association of Age v/s Severity (t-Test: Paired Two Sample for Means)		
	Age	Score
Mean	36.97	49.24
Variance	65.85	1255.48
Observations	373	373
Pearson Correlation	0.22	
Hypothesized Mean Difference	0	
df	372	
t Stat	-6.86	
P(T<=t) one-tail	1.42127E-11	
t Critical one-tail	1.648960062	
P(T<=t) two-tail	2.84255E-11	
t Critical two-tail	1.966361504	

Table II shows the Prevalence of Voice Disorders based on VHI. Participants with mild category (Mild; 0-30) based on VHI are 141. Those with moderate category for severity were 34 in number (Moderate; 31-60) while participants with the scoring of Severe (61-120) on the basis of VHI were 198. On the basis of gender, most of the female participants lied in mild category (n=16) while most of the male responses were seen in severe category (n=198) with age (61-120).

Prevalence of voice disorders in this population was determined by dividing the total score of the participants (n=18,370) with the total score of VHI in accordance with the sample (n=120×373=44,760) to get the value (0.41=41%)

On the basis of VHI subscales, as seen in Table III, most of the participants was seen to be handicapped by emotional component of their voice (mean=16.02,  $\sigma^2=159.96$ ) while functional component for voice was seen as a least contributing factor to cause voice disorders in lawyers (mean=16.8,  $\sigma^2=127.172$ ).

On association between age and severity, tabulated in Table IV, results of paired sample t-test for numeric variables indicates p value of  $1.42 \times 10^{-11}$  and  $2.84 \times 10^{-11}$  for one-tail and two-tail respectively which is very less than 0.05 i.e. ( $p < 0.05$ ) hence shows stronger significance and probability to accept the null hypothesis.

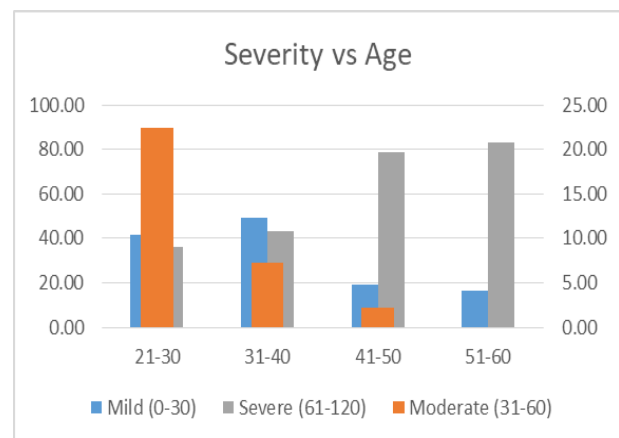


Figure 1. Severity V/S Age

The Figure 1 (according to normative data distribution) indicates the severity in the age group of (51-60) which shows that increase in severity of voice problems is directly proportional to increase in age.

## Discussion

Using the Voice Handicap Index (VHI), the current study tried to investigate its objective based on self-perception of lawyers about their voice difficulties. The prevalence was noted to be 41% in these professional vocal users. According to previous studies, the incidence of voice abnormalities among

lawyers was around 0.91%, while the prevalence among teachers was 16.3%<sup>7, 11</sup> while this study shows the prevalence of 41% which indicates that lawyers are at great risk for developing voice disorders due to their professional vocal use but they ignore changes in their voice and continue to work until the influence becomes severe enough to impede their job performance

The majority of individuals in the current study (n=198) had severe impact from their vocal difficulties as most of the participants were age  $\geq 51$  which shows that these professional voice users are unaware of their vocal limitations and fail to recognize early indicators of vocal fatigue. They continue to work for longer periods of time with existing vocal misuse or abusive behaviors and seek medical help only when it hampers their voice completely and causes severe difficulties to communicate effectively<sup>12</sup>

In previous studies, it was hypothesized that the physical components of voice problems have the greatest impact on the VHI score.<sup>13, 14</sup> But this study found the emotional subscales of the VHI to have the highest level of handicap, while the functional subscale had the lowest. This was in relation to the previous study, which found that females scored higher on the VHI emotional scales.<sup>15</sup> Another study looked into the voice handicap index among teaching professionals and discovered that the female group of participants scored higher on the emotional scale than the male participants but majority of our population was male so it can be said that male lawyers also have an emotional effect with respect to their profession. The emotional subscale received a higher score due to females' increased awareness of emotional response to their vocal output.<sup>16</sup> The inconsistent findings in this study could be attributable to the fact that there were fewer female individuals participated in the study, as well as their low work experience.

Association of age with severity of the voice problems was quiet significant ( $p < 0.005$ ) which increases with their age as the vocal alteration in elder age becomes higher.<sup>17, 18</sup>, so professional voice users who are more prone to voice handicap tend to have more chances to develop voice disorders. It is also observed that working for longer periods of time with existing vocal misuse or vocal abusing habits and seek medical care after a considerable period of time has passed since the commencement of the problem.<sup>12</sup>

## Conclusion

The study concludes that there is a significant effect of professional vocal use in lawyers with the prevalence of voice disorders and the risk increases with age by working in a profession which requires excess of vocal loading.

**Limitations:** It was noted that in Khyber-Pakhtunkhwa, female lawyers population is too low due to which stratified sampling wasn't feasible to compare the effect of gender with the prevalence and severity of voice disorders.

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